Volumetric modulated arc therapy for lung stereotactic body radiotherapy

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Purpose/objective(s). Stereotactic body radiotherapy (SBRT), also known as stereotactic ablative radiotherapy (SABR), is now a standard treatment option for patients with stage I non-small cell lung cancer (NSCLC) or oligometastatic lung tumors that are medically inoperable, old or who refuse surgery. The aim of this study is to present our initial experience with SBRT for NSCLC patients treated with volumetric modulated arc therapy (RapidArc).
Materials/methods. From August to December 2012, three-male patients with early-stage NSCLC were treated with SBRT. The mean age was 80.3 years old. All of them had histological confirmation: squamous cell carcinoma in two cases and NSCLC not otherwise specified in the other one. A slow CT scan of 2 mm thickness was performed to consider the tumor motion and define the PTV. Patients lie in a stable and comfortable position (arms above their head and below-knee support), allowing accuracy reproducibility between fractions. The SBRT schedule was 60 Gy in 8 fractions using 2-arc RapidArc plan. A CBCT was acquired daily before each treatment.
Results. Mean tumor diameter was 2.76 cm (range, 1.5–3.7 cm) and mean PTV volume was 99.05 cm^3 (range, 30.56–171.8 cm^3). For the PTV, mean D50%, D2% and D98% were 60.9 Gy (range, 60.9–61.2 Gy), 62.51 Gy (range, 62–63.2 Gy) and 57.43 Gy (range, 56.4–58.1 Gy) respectively. Mean lung dose (MLD) and mean V13 and V20 of both lungs excluding the PTV was 5.84 Gy, 14.16% and 9.05% respectively. No acute toxicity was observed according to the Common Terminology Criteria for Adverse Events (CTCAE V.4.0).
Conclusions. RapidArc for SBRT achieved a good conformity to target and a sharp dose fall-off in normal tissues in a short delivery time. After this initial evaluation, acute toxicity is comparable to other series, but we need to recruit a greater number of patients with a longer follow-up to establish long-term results.

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